Elementary Algebra Intensive College Readiness

Spring 2014 Syllabus

(MAT095I)

INSTRUCTOR: Samantha Petrone
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Office Hours by appointment

TUTOR: Evelyn Gallegos

COURSE CODE: K66H4-CUKTH

MEASUREMENTS:
Homework 40% (due *every* Tuesday by 5:00pm)
Quizzes 10%
Tests 30% (Mid-Term 10%, Final 20%)
Objectives (Pie Chart) 20%

TEXT: Beginning Algebra
Andrea Hendricks, Oiyin Pauline Chow

GENERAL COURSE PURPOSE:

To provide the student the necessary skills and techniques to be successful in college level mathematics as well as provide the student with skills to apply these concepts to real world problems. In this class students will learn about many basic mathematical concepts that are used in everyday life.

COURSE DESCRIPTION:

This course introduces fundamental algebraic concepts in preparation for Intermediate Algebra. The following topics will be covered; Arithmetic Readiness, Real Numbers and Variables, Linear Equations and Inequalities, Functions, Lines, and Systems of Equations, Integer Exponents and Polynomials, Radicals and Rational Exponents, and Complex Numbers and Quadratic Equations.

CLASS CANCELLATION:

In case of increment weather, check the college website for class cancellations or call 860-886-0177 for recorded message on the college phone.

PLAGIARISM AND ACADEMIC HONESTY:

At TRCC, we expect the highest standards of academic honesty. The Board of Trustees' Proscribed Conduct Policy prohibits cheating on examinations, unauthorized collaboration on assignments, unauthorized access to examinations or course materials, plagiarism.

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DISABILITIES:

If you have a disability that may affect your progress in this course, please meet with a Disability Service Provider (DSP) as soon as possible. Please note that accommodations cannot be provided until you provide written authorization from a DSP. TRCC Disabilities Service Providers
Counseling & Advising Office is Room A-119.

RECOMMENDED MATERIALS

- Headphones for watching and listening to ALEKS animations and video explanations
- 3-ring binder or spiral notebook for organizing notes.

STUDENT BEST PRACTICES IN THE CLASSROOM

- Arrive on-time and stay for the entire time so as not to miss learning opportunities
- Bring Math notebook, pencils, TI83/84
- Do not use cell phones, including to listen to music
- Place personal belongings out of the way (under chairs)
- Work on ALEKS outside of class to keep pace with the current objectives. If needed, use the "Explain button, making note of what you learn. Other tools, like videos and eText, may also be used.
- Be ready to ask questions in class based on any exercises that prove especially difficult.

IMPORTANT DATES:

- 1/23/14 Class Begins
- 2/6/14 No Class (Professional Day)
- 3/13/14 **Mid Term**
- 3/18/14 No Class (Spring Recess)
- 3/20/14 No Class (Spring Recess)
- 5/15/14 **Final Exam** (Last Day of Class)

DIGICATION STATEMENT:

As a student you will maintain an online learning portfolio using a college-designed template in Digication. Through this electronic tool you will have the opportunity to monitor your own growth in college-wide learning. It may even help you determine a major that is best suited to you. You will be able to keep and maintain your learning portfolio after graduation. A Three Rivers General Education Assessment Team will select and review random works to improve the college experience for all. If your work is selected and reviewed for assessment purposes, it will remain anonymous and private. Digication provides a "place" where you will connect your learning from the classroom, college, and life in general. Sometimes when you review all of the work you have done and think about it, you end up learning something different and perhaps unexpected. Please review your course outlines to determine what assignments to upload into the TRCC Digication template and please post your own choices, as well. Have fun in learning!

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OUTCOMES FOR MAT 09X USING CCSS:

Revised at 2/15/13 meeting of CACG participants at MXCC

Number Systems:

- Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.
- Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π2). For example, by truncating the decimal expansion of √2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.

Expressions and Equations work with radicals and integer exponents:

- Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, 32 × 3–5 = 3–3 = 1/33 = 1/27.
- Use square root symbols to represent solutions to equations of the form x2 = p, where p is a positive rational number. Evaluate square roots of small perfect squares. Know that √2 is irrational.
- Use numbers expressed in the form of a single digit times a whole-number power of 10 to estimate very large or very small quantities. For example, estimate the population of the United States as 3 times 108 and the population of the world as 7 times 109, and determine that the world population is more than 20 times larger.
- Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Interpret scientific notation that has been generated by technology
- Understand the connections between proportional relationships, lines, and linear equations:
- Interpret the unit rate as the slope of the graph.
- Derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.

Analyze and solve linear equations and pairs of simultaneous linear equations:

- Recognize examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).
- Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
- Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.
- Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.

- Solve real-world and mathematical problems leading to two linear equations in two variables.

Define, evaluate, and compare functions:

- Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.1
- Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line.
- Use functions to model relationships between quantities:
- Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

Understand and apply the Pythagorean Theorem:

- Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two dimensions.
- Solve real-world and mathematical problems involving perimeters, areas, and volumes:
- Apply the formulas for two and three-dimensional figures such as rectangles, circles, rectangular solids, cylinders, spheres, etc.

Seeing Structures in Expressions:

- Interpret parts of an expression, such as terms, factors, and coefficients.
- Arithmetic with Polynomials and Rational Functions:
- Add, subtract, and multiply polynomials. Divide polynomials by a monomial.

Creating Equations:

- Create linear equations and inequalities in one variable and use them to solve problems.
- Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.

Reasoning with Equations and Inequalities:

- Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution.
- Solve linear equations and inequalities in one variable.
- Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
- Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

Interpreting Functions:

- Use function notation, evaluate functions for inputs in their domains.
- Graph linear functions and show intercepts.

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Linear Models:

- Construct linear functions given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).

Mathematical Practices:

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning